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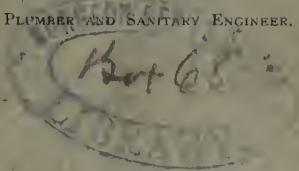
SANITARY TRACT, No. 1.

RURAL HYGIENE.

BY

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## RURAL HYGIENE.

Most of my audience have at some period heard, or perhaps shared in, the time-honored school and literary club debate, "*Which is Preferable, City or Country Life?*"—a subject recently treated with rare felicity by Frances Power Cobbe in the *New Quarterly Review*, under the title of "*The Town Mouse and the Country Mouse.*"

Every spring this conundrum distracts the thoughts of thousands of city residents. Just before the annual May migration the real estate agent, with lots or houses to sell, waxes eloquent over the charms of suburban life, and the folly of dwelling in town when all Jersey and Westchester, not to mention Long Island, offer cheap, convenient, healthy and charming homes for rich and poor alike.

Just now, when elevated railroads have abbreviated distances on Manhattan Island to a mere trifle, the problem is reversed, and many suburban residents are drawn to the city by its theatres, operas, churches, clubs, dog shows, walking matches, and other manifold attractions.

The claims of the country as a place of residence for persons doing business in the city are being reconsidered, and the result may seriously affect the future prosperity of this and other suburban localities.

The consideration that influences most persons to move into the country is its supposed greater healthfulness; but there has been a strong

reaction in the opposite direction, due to the wide prevalence of malaria and other sickness in much of the district around New York.

Let us look at the facts.

No one will deny that a rural neighborhood mainly occupied by farmers and private families, without the factories, crowded tenements, the narrow, dirty streets, cellar population, and general squalor and filth of a metropolis, should be a healthy place of abode. And such is the case in the ideal condition of things.

In the report of the Wisconsin State Board of Health for 1877 the record of Wood township, of 300 inhabitants, is given, showing that in two years there were but three natural deaths, and that during 27 years the cemetery contained but 13 graves. This is equivalent to a mortality of 5 in 1,000, or about one-fifth of the death-rate of New York City.

The village of Lennox, in Berkshire, Mass., is another remarkably salubrious place, and is much sought by invalids. Its tombstones record a remarkable longevity among its inhabitants. The same is true of West Stockbridge. In the Oneida Community it is asserted that diphtheria, croup and cholera infantum are unknown, and that of 55 children born since 1869, 50 are now living. The town of Auburn, Mass., in 1877, had 14 deaths in 1,000, mostly aged persons. The place is so healthy that it cannot support a physician. Sherborn in the same State had but 15 deaths in 1,000, and was free from nearly all diseases. Southbridge had about the same mortality, with a population six times greater. Its healthfulness is due to the porous subsoil affording free drainage.

These are all small communities, but the case of Lansing, Mich., may be cited as a model sanitary city.

Indeed, it may truly be called a poor place to die in. Though its population has nearly doubled in the last ten years, the number of burials for 1877 was but three more than in 1868. This is accounted for by sanitary measures which have been carried out by the city authorities, and the drainage and reclamation of many thousands of acres of swamp lands. In 1874 the death-rate in Lansing was but 10.2 in every 1,000 inhabitants, the lowest in 17 leading cities. This remarkable record may be credited to the energetic efforts of the Michigan State Board of Health, which has its headquarters there, and which is a live institution.

But these examples are rare and exceptional. "The trail of the serpent is over them all," and insidious infection is found in Nature's most beautiful haunts. No place, however lovely and serene, can escape its stealthy approach. Calm Concord, where the woods and waters seem steeped in transcendental tranquility, is not free from scarlet fever, diphtheria and typhoid. On lofty hills, in quiet valleys, on breezy plains, the story is still the same. In your own State of New Jersey, the chain of watering-places on your surf-swept shores are being sown with the seeds of disease by man's neglect and folly.

It is consummate irony to apply the term "health resorts" to such places.

Even in Colorado, the Switzerland of America, where for 12 years, with a population of 30,000, here was not a single authenticated case of

diphtheria, and where the frontiersmen declared that they "had to visit a settlement to take cold," epidemics have already appeared, and a State Board of Health has become necessary.

Is it not a natural inference from all these facts that human influence is responsible for this state of things, and should not they be taken as a warning by all dwelling in like conditions?

When it is shown, as I shall strive to do later on, that all these evil conditions may be wholly removed by simple sanitary measures, the need of such measures will be demonstrated.

For the present, let us consider more in detail the evil conditions that create insalubrity in the country, and neutralize its natural advantages.

And first, there is *Malaria*. To define this evil has long puzzled the physicians. Whether it is of vegetable origin or the product of a germ is an unsettled problem, which will doubtless be found in time, but it does not specially concern us at present.

Col. Waring says: "For more than two thousand years, malarial diseases have been known, and probably studied and discussed. At the present day we *know* absolutely nothing whatever about their ultimate origin." He adds, "While we cannot recognize the manner in which the cause of the disease operates, nor the manner in which the cause is generated, nor, indeed, what the cause is, we do know by observation that it is very generally an accompaniment of certain conditions which, so far as the soil is concerned, we have it in our power to remove."

Prof. Bartholomew, of Cincinnati, in a late lecture on the "Hygiene of Suburban Life,"

treats very fully of the influences which tend to produce and extend malaria. He refers particularly to the common error of forming artificial ponds by blocking the natural course of surface drainage, of over-abundant shrubbery, and especially of removing belts of intercepting trees between marsh and hill-side. "When some vandal destroys those friendly guardians of the hills," he says, "woe betide those who live in palaces on the top." After many excellent observations about water supply, sewage, ventilation, etc., he concludes with a warning to the suburban resident against the risk of exposure, hurried meals, and general fatigue of daily travel to and from the city. "The hurry at breakfast, the scramble at lunch, and the fatigue and indifference with which dinner in the evening too often is taken, are injurious to the stomach of your suburban resident." Yet on the whole he concludes that the change relieves the mind and rests the body, sleep is sounder and more refreshing, the bodily functions are better performed, and an increased measure of physical and mental health must result.

New York, in its colonial history and its younger years, was a remarkably healthy town. Now there is almost an exact malaria line in the city, north of which, in newer quarters, some forms of malarial troubles appear, and south of which these diseases are scarcely known.

How is this fever-line to be accounted for unless on the assumption that it is the line which separates natural and artificial drainage—where sewers and water mains end and where cess-pools and wells begin?

The experience of Irvington and its vicinity may well serve as a warning and example to residents of all similar suburban places. A few years since this locality had an enviable reputation for health. Its fine scenery, romantic associations and accessibility attracted the wealthiest class of residents, who spared no pains to improve its natural advantages. Indeed, "improvement" seems to have been over-done. To quote from Col. Waring's vivid description of this locality :

"The influx of a wealthy population has had a most pernicious influence. Where the natural conditions were arid and bleak, art has done its extravagant utmost to change them. The banks of the Hudson River must have been a wonderful field for the enterprise of the nurserymen. Thousands of trees and shrubs were planted to produce an immediate effect, where hundreds would have done better service in a longer time, and the thousands have been left to stand, choking each others' growth, marring each others' beauty, covering the ground with impenetrable shade, burying it under a deposit of decaying leaves, and shutting out the circulation of air. The banks of the frequent deep ravines are overgrown with trees and bushes, until their air is held stagnant, and they are permeated with dankness and the odor of rotting vegetation. There are many small brooks whose volume is subject to frequent and sudden change, and many of which are nearly dry in summer. These have been damned into bedeviling ponds, from end to end, and have been made a serious element of trouble. The banks of the brooks are often swampy and overgrown with alders, and some of them serve as common sewers for the removal of household filth and the drainage of stables, pig-stys, etc. The ponds are generally filled nearly full with silt and leaves, and their bottoms are in summer exposed to the heat of the sun. Sometimes the water is raised to such a height as to turn the low flat shores into miniature swamps. Often the dams and embankments by which the ponds are formed leak so as to saturate a con



siderable area below them. Now and then during a flood a dam gives way, and the accumulated waters pour down, depositing rubbish along the route, cutting new channels for the brook, and deranging its whole course."

A resident physician reports a vast increase in the consumption of quinine by the inhabitants, and states that he has repeatedly warned individuals against unsanitary innovations before they were made on their grounds, and afterwards prescribed for maladies in their families occasioned by a disregard of those warnings. Many of the wealthiest residents publicly announce that their property is for sale unless its salubriety can be restored, and Col. Waring has been engaged by the "Irvington Neighbors" to make an examination of the locality and report a plan for removing the prevalent malaria. The result of this experiment in sanitary reform will be looked for with much interest, and it will undoubtedly lead to valuable results.

The moral of this history is all the more important from the fact that Irvington is not a particularly bad neighborhood. Col. Waring states emphatically :

"With much knowledge of the country surrounding New York on every side, I believe that the vicinity of Irvington is more free from malaria than three-fourths of the country within the same distance from the City Hall. It has not been made worse by the honest expression of opinion on the part of its residents, and it is likely to be made better by reason of their energetic action."

It therefore behooves every rural resident to consider if he has any excuse for neglecting like precautions to prevent like evils.

The following humorous description by one of the Irvington neighbors of another region about New York tells its own story. He says :

"In 1862 and 1863 I occupied a place in Whitestone, adjoining Flushing, on Long Island, overlooking the noble Sound. Before I went there I took the assurances of several distinguished divines, lawyers, physicians, bankers, merchants, and officials who resided there, that that particular locality was exempt from chills and fever, although 'they had it like blazes at Flushing and Bay Side.' The result was that, leaving me out, my whole family, my servants, and all friends who visited us, and, I sometimes thought, my domestic animals, except musquitos, had the disease. I raised such a clamor about it that I was threatened with a ducking in the noble East River, and dared not go back there to live, or to die rather, even if I had been so minded. I escaped by taking quinine as regularly as I did my mcals."

To come a little nearer home. A New Jersey subscriber to one of the New York daily papers lately wrote as follows regarding the condition of the dwellings of those who live in the suburbs:

"I live in one of the pleasantest spots of Bergen County. Born and brought up in New York City, I do not live in the country from choice. I found that as my family grew up and enlarged all expenses increased, and particularly my physician's bills. I was told that from an outlay of \$500 a year chargeable for his services, I would probably be able to discount him 75 per cent. by going to the country, and I went.

"Well, either I have been outrageously deceived or a victim of bad luck. I have absorbed nearly six months' salary each year for medical attendance. Hardly a week has passed since I became a resident that one of the profession has not been called upon to prescribe for some of us. I buried two children in a single year, and one is just recovering from scarlet fever and low typhoid. But I think I have discovered the cause. Like hundreds of others, my quarters are contracted, and in the absence of sewers the waste water is conducted from the kitchen in a 'home-made' imperfect drain to a cesspool not ten feet away. Although covered, it is almost always full, the ground draws it in so slowly. Then, again, there being

no cellar under the barn, all winter vegetables are stored in the house cellar. Here they remain week in and week out, gradually decaying.

"I have had the drain properly constructed, and the vegetables taken from the cellar. The house is thoroughly ventilated daily, and a bright, dearly loved boy, that I feared was to be taken by death, is rapidly recovering.

"I am well aware that these matters are regulated in the villas of the wealthy, but the larger per cent. of country residents are the middle classes, and to them are physicians indebted for the rich harvest they are now reaping."

A like experience could be related by scores of residents of other suburban localities.

What is the condition of Staten Island to-day, one of the most picturesque spots on the continent?—"a promising field for the sanitary engineer," as a resident physician reports.

In Stamford, Conn., a short-sighted policy in sanitary matters is causing serious ill results. The water supply is ample, and is abundantly consumed. But as there is no proper drainage system, the ground is gradually being saturated with moisture. In consequence, consumption and like diseases are on the increase. Many families have moved, and, before long, property values must be influenced by these results. Yet in the face of these facts, plans for sewerage have been steadily opposed, the local physicians in particular being, it is said, most earnest in their resistance.

Plainfield is another locality which is said to be threatened with malaria, bred by shallow wells and cesspools lying side by side in a gravelly soil.

From Rahway come complaints of miasma in a district occupied by some of the finest residences, while the water supply also shows contamination.

Each individual is perhaps aware of certain annoyances which he endures like a martyr (often too literally true) in the delusion that these are isolated cases, but to any one that makes a detailed and systematic investigation, the magnitude of the evil becomes appalling. Rich and poor alike suffer—each reacts upon the other. In one wealthy family at Irvington 13 out of 18 persons, in spite of great caution, were attacked with malaria after a short residence. In a laborers' settlement at Abbotsford, near by, where a foul stream ran close to the houses, not a person escaped chills and fever, but as a rule the poorer people, who occupy the hollows and low lands, suffer most.

Even if your own homes are perfectly healthy, and you feel free from any chance of harm from the evils that have been recited, yet you cannot escape the chance of contamination from the maladies which may seize your poorer neighbors. In Kingsley's "Alton Locke" there is an account of the infection of a duke's daughter with typhoid fever by a riding habit sent home from a tailor's, and Carlyle vigorously tells of an Irish widow who proved to the people of Edinburgh that she was the sister of the best of them by imparting typhus to sixteen of them. However much cleanliness may be a luxury, the luxurious cannot sleep in peace until they compel their poor neighbors to share in this comfort. Henry Armit Brown might have been alive this day, but for the fever that drainage kills. And Mr. Rockwell's family in Brooklyn, whose sickness has been ascribed to sewer gas, it is believed really caught contagion from a family nurse.

And now having detailed the dangers which threaten every locality situated as Orange is, let me suggest some of the possible remedies.

These are simple and easily available.

I take it for granted that Orange, in respect to salubrity, has not many superiors among American towns. It is a good sign to see so few drug stores in a town, and the reputation of the place for health has always been good. Yet still much must be done to preserve this good reputation. It is not well to indulge in too confident feeling of security.

If we descend to details, the measures proposed by Col. Waring for the relief of Irvington will apply generally to other like locations. He says : " At least one-half of the problem in question might be solved by a rigorous and vigorous use of the hatchet and the axe. I believe, too, that if this were more judiciously done, not only the future, but the present beauty of the whole region would be as much improved as would its healthfulness."

An abundant supply of fresh air and sunlight, the drainage of all marshy places, with the exclusion of salt water if on the tide-level, and the growth of the best vegetation that the degree of drainage will allow, is further advised.

Many localities where disease formerly prevailed, and where it had originated spontaneously, have been made perfectly healthy by drainage. The fens of Lincolnshire, in England, and marshy districts along the lower Thames, were formerly greatly scourged with fever and ague, and with malarial neuralgia. The extensive drainage operations carried on in these districts

have had the effect of removing these ailments entirely.

It will be necessary to provide secure and cleanly channels for all streams, to substitute better means of sewerage removal, to abandon the ponds, to clear up the ravines, to thin out and remove a considerable amount of vegetation, and to drain all swamps, springs, and marshy places. The alternate submersion and exposure of low, flat lands by using them as ice-ponds in winter and then drawing off the water in spring, is to be avoided. All stagnant ponds are to be cleaned, drained, or walled ; the brooks cleaned out and walled ; the pig-sties and slaughter-houses removed ; a regular system of drainage to be constructed in the villages, and, if possible, a supply of water to be secured which shall prevent the necessity of wells, and great care be taken that no cesspools drain into springs.

Another very serious evil needs to be remedied, and that is to carry off to the nearest secure outlet all the water that heavily built roads tend to dam up and hold back by pressure upon the subsoil. All highways should be thoroughly under-drained with open stone drains, or porous tile laid at suitable depth. With such drains running under each side of the roads, but especially on an up-hill side, much of this evil of wet soil in the adjoining fields would be obviated.

While larger sanitary works, such as sewerage, water supply, inspection of nuisances, street cleaning, etc., must be undertaken by the public authorities, yet upon the vigilance of the individual householder most depends the health of the family. The conditions of health depend upon

cleanliness, pure air, clean water, rapid removal of all refuse, and perfect exclusion of all foul matters arising outside the house. All dirt is not equally dangerous, but that which contains the germs of disease is most to be feared and got rid of as speedily as possible. People may live amid dirt for years without harm, but once let poison-germs gain access into horse-pond, dwelling, or drain, and an epidemic follows. The ideal house is one that can stand the test of illness outside and illness within without spreading contagion. The main object, therefore, of the householder should be to exclude poison-germs from without, and when they arise within to prevent them from spreading or remaining.

A man is not fit to be the head of a family who does not acquaint himself with the requirements of sanitary law, and personally satisfy himself that those requirements have been observed.

What are the essentials of a healthy home ?

*First*, there should be a dry site upon a porous, well-drained soil, to ensure that no dampness shall penetrate within the walls.

*Second*, a cheerful, sunny outlook, with a Southern exposure if possible. Plants and animals love the light ; a sick person usually lies with his or her face to the window. "A dark house is always an ill-aired house, a dirty house," says Florence Nightingale ; "want of light stops growth, and promotes scrofula, rickets, etc., among the children. People lose their health in a dark house, and if they get ill they cannot get well again in it."

*Third*, insist upon an abundant supply of pure air. Voltaire scornfully called the air "a blue

and white heap of exhalations." If he had had any experience of the kind of air to be found in modern dwellings he might have used the much more striking phrase of Prof. Huxley, "a stir-about of solid particles floating in the atmosphere."

Dr. Richardson, the eminent English sanitarian, recommends: "To avoid the admission into closed apartments of air that offends the sense of smell. To avoid surcharging the air with vapor of water. To keep the temperature in every room as nearly as possible at 60°. To allow air to escape by every available outward draught, by the chimney flue especially. To admit air freely at all times, especially when a room is not in use and the external air is not charged with moisture."

*Fourth*, DAMPNESS.—Worse even than a dark dwelling is a damp one. The close connection between a wet soil and the prevalence of consumption and malaria has been long established. Drainage is followed at once by increasing salubrity. But even upon a dry, porous soil, danger is incurred by carelessness in allowing water to soak into ground adjacent to houses, from waste pipes and from dripping roofs. In consequence, such dwellings become filled with "dry rot," and unfit for human habitation. Damp cellars are also far too common, and are not regarded as specially dangerous, yet they should never be permitted, as it is always possible to exclude damp.

*Fifth*, comes PURE WATER. To obtain this desideratum is the most difficult problem of all. A damp site may have drainage or water tight



foundations, people can even exist (not live) without sunlight, but pure water must be had or we die. And yet, is it a paradox to say that it is rarely found in country homes? In hundreds, nay, thousands of homes, cesspools and wells stand side by side, and their contents mingle constantly.

CESSPOOLS.—Mr. E. S. Philbrick, the eminent engineer, calls cesspools “an abomination,” and so is every other device for storing up and retaining any refuse in the vicinity of a dwelling house. The only excuse for any sort of a cesspool near a house is to separate grease from kitchen drains. Small, tight, brick tanks or stoneware grease-pots seem to be a necessary evil among a population who waste or whose servants waste so much fatty matter in their kitchen sinks as ours.

Every cesspool must be ventilated. To do this *two* openings are necessary as is illustrated by the following simple experiment: Into a common wide-mouthed pickle-bottle fit a bung; into this put a piece of tube of any kind, about 18 in. long. Fill the bottle with smoke from a tobacco-pipe or otherwise; then blow across the top of the pipe, and you will find it will not clear the bottle of its smoke. Now, repeat the experiment, but previous to doing so, make a hole in the bung, into which a short piece of pipe is put. Then blow across the upper opening, and you will find the bottle clear of smoke, as if by magic.

A significant item appeared in one of the papers the other day, in reference to the decline in real estate on Staten Island. An old Snug Harbor sailor who has for years enjoyed leisure to con-

template the rise and fall of valuations on Staten Island, pointed to the constantly increasing number of smoking and busy factories on the Jersey shore, said: "There's paint works, zinc works, sulphur works, oil refineries, and chemical works, all a-sending out very peculiar smells. Them smells don't annoy us sailors partickler, but they keep real estate rayther low down."

The owners of fine private residences cannot afford to allow their property, comfort and health to be ruined in this manner, and they must see the necessity of checking such nuisances. It is not necessary to suppress all commercial enterprises like those named above. Regulation alone will make them enduring and harmless.

It is an indication of how backward we Americans are in sanitary matters that so little has been done to institute hygienic laws outside the few leading cities of the Union. Last year five prominent towns in Massachusetts declined the authority offered them to appoint independent boards of health, while five others would not even vote upon the question.

This apathy concerning the vital interests of public health and safety is in striking contrast to what is seen across the water.

More than two centuries ago we read that Shakespeare's father was repeatedly fined by the authorities of Stratford-on-Avon for throwing garbage into the streets in front of his cottage. If such an insignificant hamlet as Stratford could have so much regard for sanitary rules at that time, is it not surprising that our town and village authorities so lamentably neglect these matters?

In Great Britain there is now an elaborate

system of sanitary laws which apply to the smallest hamlet.

Time will hardly permit any reference to the details of a sanitary code for a city like Orange, but some of its main features may be outlined as follows :

One of the first public agitators of sanitation in this country, the late Dr. John Griscom, formerly held that the Declaration of Independence laid down the first principles of sanitary laws when it declared that all men possessed certain "inalienable rights, including the right to life, liberty, and the pursuit of happiness." The first of these, the right to LIFE, assured to each individual freedom from contagious or other influences hurtful to life. The necessity of drainage, of quarantine, of vaccination, and other sanitary regulations was a logical inference from this principle.

If we take Herbert Spencer's axiom, that every man has a right to exercise all his activities so long as he does not prevent his neighbor from doing the same, then it may be inferred that no one has a right to cater to his own interests at the cost of his neighbor's health.

The duty of the State is undeniably to protect the many even at the expense of the few. No one should be allowed to build a factory belching forth noisome vapors directly into the windows of his neighbors. Neither should he be permitted to dam up a water course to form a pleasure-pond, and thus make a pestilent, fever-breeding swamp in the midst of a community.

In a late paper read before the Sanitary Congress at Cheltenham, Eng., upon the unsanitary

condition of small towns, among the remedies suggested was the appointment of a sufficient number of qualified inspectors, who should have power to enter and inspect dwellings periodically ; and the compulsory employment of an architect by everybody building a house. It was urged that there is as great a necessity for granting a diploma of competency to architects, and to make it impossible to build a house without an architect, as for a man to practice as a surgeon without legal qualification. The paper also spoke of the value of educating every householder in sanitary and domestic requirements.

I would amend this proviso so as to read, an architect competent in sanitary matters ; for it is unfortunately true that too many architects are indifferent to the importance of such subjects, and they need to be reminded of the advice of Sir Charles Barry, President of the British Institute of Architects, in a late address before that body : “ It ought to be impossible to allege with truth, as is so often done, that architects care only for the æsthetical, and delegate to subordinates the vital questions of ventilation, warming, lighting, sanitary arrangements, &c.”

Legal measures for the abatement of nuisances are desirable, but unless backed and sustained by an enlightened public sentiment they will prove of small avail and difficult to enforce. The health officer at best is only the agent of the public. He must largely content himself with the part of a public agitator. His work is mainly educational, and while he can guide and lead public sentiment, he must not proceed too rapidly or too far in advance.

For my own part, I strongly believe in the good effects of popular agitation and the diffusion of sound information. The valuable work of Mr. Jas. C. Bayles on House Drainage and Water Service, or that of Mr. Eggleston on Village Life, or Professor Fleeming Jenkin's "Healthy Houses," with Col. Waring's various writings, and Appleton's new Health Primers, should all be circulated freely. Still more is it desirable to distribute sanitary tracts, such as those of the Hampton series, now issued by G. P. Putnam's Sons, containing useful facts in a brief, attractive form adapted to teach the ordinary reader the cardinal principles of hygiene.

Why not offer a prize for the best brief, popular statement of the health problem to be overcome in this very place, and invite competition? It would draw general attention to the matter, and probably throw valuable light on the subject. I make this suggestion to any of my hearers who are philanthropically disposed, and leave it to them to act upon it if they choose.

Finally, I would earnestly recommend the counsel of an eminent American engineer in a similar case to that of Orange: "No rules can be given except very general ones, among which the first is to employ an expert before undertaking any practical work, and make haste slowly, *i. e.*, 'When you know not what to do, be careful that you do not do you know not what!'"

I hold that it is the duty of the public authorities to attend to the public health. The democratic theory of "government of the people, for the people, by the people," implies this. Joint action is needed to insure system, and official

authority is requisite to enforce legal enactments.

Private Sanitary Associations, like those of Edinburgh and Liverpool abroad, and at Irvington and Newport at home, are useful in many respects, but their benefits are limited to the few who can pay for them. The poor and ignorant, who most need instruction and direction in matters of hygiene, cannot avail themselves of such agencies.

The best expert advice should be obtained, and a comprehensive plan, adapted to the needs of the future as well as of the present, should be developed, embracing a system of drainage, water supply, street cleaning, registration of births and deaths, prevention of infection, etc.

It is specially important to impose checks upon the spread of infectious diseases. To do this a system of registration of deaths is necessary. Particular care should also be taken to prevent children from attending school when there is sickness in their homes or before they have recovered from contagious diseases. Statistics gathered by the Brooklyn Board of Health last year showed that as soon as school vacation began there was an immediate decline in the cases of diphtheria and scarlet fever, but as soon as studies were resumed the reported cases increased so largely as to leave little doubt that the aggregation of children in schools helped to disseminate these maladies. The Massachusetts State Health Report for 1878 also report that many cases of whooping cough, scarlet fever, and diphtheria could be traced directly to the schools, whose unventilated, close rooms became centres of contagion.

If it was required that when a pupil was absent from sickness that a written statement of the nature of the complaint should be sent to the teacher, a valuable register would be obtained, which would be of great service in many ways.

Sleeping in rooms on the ground floor and on feather beds instead of straw or hair mattresses, is complained of by sanitary experts as a prime source of the illness of many rural inhabitants. Children and servants are put to sleep in garrets or in dark, unventilated bedrooms, while the heads of the household "repose" with the windows opening close above the outlet to the kitchen sink, and redolent with household smells of all sorts and degrees.

But I can fancy the average householder asking in dismay, "Is all this necessary? Can we afford it? Will it pay?" My answer is :

*First*, experience proves that some such action is indispensable. Is not this the only inference from all the facts previously cited?

*Secondly*, the right way to do a thing is always the cheapest in the long run. A half-developed scheme, or an incomplete one, is usually a failure.

*Thirdly*, that it will pay is proved by abundant evidence.

Tottenham, Eng., affords convincing evidence of the value of sanitary effort. In 1871, Dr. E. H. May and sixty other gentlemen organized an association, which has brought to an end the pollution of the water supply, ventilated the old sewers and had new ones built, abated nuisances, increased the water supply, and vigilantly supervised the dairies and slaughter-houses. In spite of rapid growth of population, the total number of deaths from fevers during the three years

1874-75-76, was only 23, as compared with 99 during the years 1871-72-73 ; the deaths from diarrhœa were only 52, as compared with 86, and the seven principal zymotic diseases only 200, as compared with 343. In spite of the rapid growth of population, as evidenced by the fact that the total number of births during 1874-75-76 was 445 more than during 1871-72-73, the total number of deaths was only 79 more. *As a consequence of the confidence inspired in the public by these measures, in spite of the present general commercial depression, there were less than 200 empty houses in Tottenham in 1876, while in 1871—a time of great commercial prosperity generally—the number was as high as 600.*

The saving which may be accomplished by proper sanitary measures may be accurately estimated in dollars in cents. The results of sanitary works in Great Britain are shown in a greatly diminished death rate. In certain towns the mortality was lessened as high as 32 per cent., or 100 lives each year in a town of 30,000 inhabitants. It is estimated that the money value of an English farm laborer at 25 years of age is \$1,230, which represents the amount of his future earnings less the necessary cost of his maintenance. Thus 100 lives annually sacrificed by deficient drainage would represent a money loss of \$123,000 to the community. If a valuation were placed upon the lives of a higher class of workers, including professional and business men, the amount would be far greater. What money value could represent the loss to the people of England by the death of Prince Albert, for example? or what sum would compensate the early cutting off of a Watt, a Stephenson, a Vanderbilt,



or a Lincoln? It is, however, sufficient for our purpose to take the lowest class as a basis, so that the calculation may not seem exaggerated.

It is estimated that the cost of an average funeral is \$25. Dr. Lyon Playfair has also calculated that for every unnecessary death from unsanitary conditions we have 28 cases of sickness. The consequent loss of time and labor owing to such sickness would easily average \$5 per case, including medical attendance and other allowances. It is safe to say, in view of these items of loss, that any city which had introduced proper sanitary works would save sufficient in the course of a very few years to pay the full cost of these improvements.

It is not to be expected that sanitary reform will be brought about without strong objections and opposition. In New York City respectable, intelligent and wealthy property owners were loud in their protests and warnings that the Croton aqueduct system would prove a total failure, as inadequate, unreliable and too costly, that it would be ultimately abandoned, and that the pump system would be revived as the only sure and convenient means of supplying this great city with water.

Time has fully shown the absurdity of these objections, and justified the outlay; and in a like manner, I am sure, any local opposition to sanitary improvement in Orange will soon yield to reason and the certainty of beneficent results.

In small towns and villages the cost of sanitary improvement is often beyond the means of the population, but associated effort can accomplish the desired result when there is an earnest desire, even if the means are small.

In a city with the resources of Orange this deficiency will not be so serious. But even here it is hard to say what should be done with many old and dilapidated dwellings which are unsuited for human habitation and yet which the owners insist upon occupying.

Dr. Richardson, the English sanitarian, has

planned a model city of health, to be called "Hygeia," where human beings would enjoy perfect health. The details are all strictly possible, and only the novelty and the fear of expense stand in the way of its practical realization. He cites the wonderful results of sanitary rules when strictly enforced, which have been obtained in our best prisons, where the worst class morally and also physically in the community have been brought to the highest hygienic condition, and infers that if our homes were as well regulated the public health would be vastly improved.

Is there any reason why Orange, with its magnificent natural advantages, should not become a veritable city of Hygeia? It is perfectly practicable, and is a result which every one within its limits should strive to attain.

You are all familiar with the famous charity sermon of Dean Swift on the text, "He that giveth to the poor lendeth to the Lord, and whatsoever he giveth it shall be returned to him seven-fold." The Dean read the text, closed the book, and after a pause said, "Brethren, you have heard the offer; if the interest is sufficient, and the security satisfactory, then *down with the dust!*"

In a like manner, I may close these desultory remarks with Hypocrates' summary of the essentials of health: "Pure air, pure soil, and pure water." These you must have to avoid disease; without them your homes will become uninhabitable, health and happiness will take to themselves wings, and your life will be misery.

But to have these essentials you must pay the price; you must down with the dust. Nothing ever comes of nothing, and public health, like everything worth having, costs labor and thought and continued effort.

I have no fears that in this enlightened community any of these requisites will be lacking as soon as it is really understood that they must be had.



